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10/031,852	01/24/2002	Hiroaki Onishi	2002-0075A	8431

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EXAMINER

HINZE, LEO T

ART UNIT PAPER NUMBER

2854

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,852

Applicant(s)

ONISHI ET AL

Examiner

Leo T. Hinze

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) 26-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-13 is/are rejected.
- 7) ☐ Claim(s) 9, 10 and 14-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5, 6. 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-25 in Paper No. 9 is acknowledged.

Claim Objections

2. Claims 11-15 and 24-25 are objected to because of the following informalities:

Claim 11 recites the limitation "the pressurizing member" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3, 5-7, and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chikahisa et al., US 5,479,854 in view of Jaffa, US 3,796,153.

Chikahisa et al. teach:

- a solder paste printing apparatus for printing a solder paste supplied onto a surface of a printing mask (30) where an opening is formed by moving a squeegee (1) on the surface in a printing direction on a circuit-forming body placed on a back surface of the printing mask via the opening (col. 1, lines 8-9) (claim 1);
- wherein a pair of squeegees are provided, and at least one of the pair of squeegees is consistently brought in contact with the printing mask at least during printing (Fig. 1) (claim 5);
- a solder paste printing method for printing a solder paste located on a surface of a printing mask where an opening is formed by moving a squeegee (1) on the surface (30) in a printing direction on a circuit-forming body placed on a back surface of the printing mask via the opening (col. 1, lines 8-9) (claim 11).

Chikahisa et al. do not teach:

- an elongated pressurizing member that has an axial direction extended roughly parallel to an axial direction of the squeegee and is able to form between the

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pressurizing member and the printing mask a first gap through which the solder paste can pass in a direction opposite to the printing direction of the squeegee during solder paste printing and is arranged so as to form between the pressurizing member and the squeegee a second gap through which the solder paste can pass from the first gap toward the squeegee side, the pressurizing member being provided in a vicinity of an edge of the squeegee, whereby a pressure toward the printing mask is applied to the solder paste by the pressurizing member when the solder paste passes through the first gap located between the pressurizing member and the printing mask during the solder paste printing (claim 1);

- wherein the pressurizing member is movably mounted with respect to the squeegee between a pressurizing position where the pressure is applied to the solder paste and a retreated position where the applying of the pressure is released, provided with an axial direction extended roughly parallel to the axial direction of the squeegee in the pressurizing position, is able to form the first gap through which the solder paste can pass in the direction opposite to the printing direction of the squeegee during the solder paste printing, and is arranged so that the second gap through which the solder paste can pass from the first gap toward the squeegee side is arranged between the pressurizing member and the squeegee (claim 2);
- wherein the pressurizing member is a round bar (claim 3);
- wherein the first gap has a roughly wedge-shaped cross-section shape that is narrowed toward the squeegee (claim 6);

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- wherein the pressurizing member has a height from the surface of the printing mask, the height being lower than a rolling height of the solder paste during printing, and the pressurizing member sinks in the rolling solder paste during the printing (claim 7);
- applying a pressure toward the printing mask from the pressurizing member to the solder paste by making the solder paste pass in a direction opposite to the printing direction of the squeegee through a first gap formed between the printing mask and the pressurizing member during solder paste printing in a state in which an elongated pressurizing member provided in a vicinity of an edge of the squeegee is positioned in a pressurizing position where a pressure is applied to the solder paste from a retreated position where no pressure is applied thereto; and making the solder paste pass again through the first gap located between the pressurizing member and the printing mask after the solder paste that is passing from the first gap toward the squeegee side passes through a second gap located between the squeegee and the pressurizing member (claim 11);
- wherein an interval of the first gap is smaller than a rolling height of the solder paste during printing, and the pressurizing member sinks in the rolling solder paste during printing (claim 12).

Jaffa teaches a squeegee assembly including:

- an elongated pressurizing member (18) that has an axial direction extended roughly parallel to an axial direction of the squeegee (17) and is able to form between the pressurizing member and the printing mask a first gap through which the solder paste

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can pass in a direction opposite to the printing direction of the squeegee during solder paste printing and is arranged so as to form between the pressurizing member and the squeegee a second gap through which the solder paste can pass from the first gap toward the squeegee side, the pressurizing member being provided in a vicinity of an edge of the squeegee, whereby a pressure toward the printing mask is applied to the solder paste by the pressurizing member when the solder paste passes through the first gap located between the pressurizing member and the printing mask during the solder paste printing (Fig. 3) (claim 1);

- wherein the pressurizing member is movably mounted (on brackets 19, col. 3, lines 60-62) with respect to the squeegee between a pressurizing position where the pressure is applied to the solder paste and a retreated position where the applying of the pressure is released, provided with an axial direction extended roughly parallel to the axial direction of the squeegee in the pressurizing position, is able to form the first gap through which the solder paste can pass in the direction opposite to the printing direction of the squeegee during the solder paste printing, and is arranged so that the second gap through which the solder paste can pass from the first gap toward the squeegee side is arranged between the pressurizing member and the squeegee (claim 2);
- wherein the pressurizing member is a round bar (claim 3);
- wherein the first gap has a roughly wedge-shaped cross-section shape that is narrowed toward the squeegee (Fig. 3) (claim 6);
- wherein the pressurizing member has a height from the surface of the printing mask,

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the height being lower than a rolling height of the solder paste during printing, and the pressurizing member sinks in the rolling solder paste during the printing (Fig. 3) (claim 7);

- applying a pressure toward the printing mask from the pressurizing member (18) to the solder paste by making the solder paste pass in a direction opposite to the printing direction of the squeegee (17) through a first gap formed between the printing mask and the pressurizing member during solder paste printing in a state in which an elongated pressurizing member provided in a vicinity of an edge of the squeegee is positioned in a pressurizing position where a pressure is applied to the solder paste from a retreated position where no pressure is applied thereto; and making the solder paste pass again through the first gap located between the pressurizing member and the printing mask after the solder paste that is passing from the first gap toward the squeegee side passes through a second gap located between the squeegee and the pressurizing member (Fig. 3) (claim 11);
- wherein an interval of the first gap is smaller than a rolling height of the solder paste during printing, and the pressurizing member sinks in the rolling solder paste during printing (Fig. 3) (claim 12);
- that the flood bar tends to initiate the flow of color through the openings in advance of the squeegee (col. 4, lines 30-32), which results in a heavier deposit of ink or color to produce an improved print (col. 4, lines 35-38).

Regarding claims 1-3, 6-7, and 11-12, it would have been obvious to one having ordinary

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skill in the art at the time the invention was made to modify Chikahisa to include a round bar axial to the squeegee, movable, and immersed in the solder, because Jaffa teaches that such a bar is advantageous for helping to initiate the flow of color through the openings in advance of the squeegee, which results in a heavier deposit of ink or color to produce an improved print.

Regarding claim 5, the combination of Chikahisa and Jaffa teaches all that is claimed as discussed above.

6. Claims 1, 4, 8, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chikahisa et al., US 5,479,854 in view of Watanabe, US 5,786,029.

Chikahisa et al. teach:

- a solder paste printing apparatus for printing a solder paste supplied onto a surface of a printing mask (30) where an opening is formed by moving a squeegee (1) on the surface in a printing direction on a circuit-forming body placed on a back surface of the printing mask via the opening (col. 1, lines 8-9) (claim 1);
- a solder paste printing method for printing a solder paste located on a surface of a printing mask where an opening is formed by moving a squeegee (1) on the surface (30) in a printing direction on a circuit-forming body placed on a back surface of the printing mask via the opening (col. 1, lines 8-9) (claim 11).

Chikahisa et al. do not teach:

- an elongated pressurizing member that has an axial direction extended roughly parallel to an axial direction of the squeegee and is able to form between the pressurizing member and the printing mask a first gap through which the solder paste

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can pass in a direction opposite to the printing direction of the squeegee during solder paste printing and is arranged so as to form between the pressurizing member and the squeegee a second gap through which the solder paste can pass from the first gap toward the squeegee side, the pressurizing member being provided in a vicinity of an edge of the squeegee, whereby a pressure toward the printing mask is applied to the solder paste by the pressurizing member when the solder paste passes through the first gap located between the pressurizing member and the printing mask during the solder paste printing (claim 1);

- wherein the pressurizing member has a built-in heat-generating element for heating the solder paste (claim 4);
- wherein the pressurizing member is fixed so as to be unable to rotate (claims 8 and 13);
- applying a pressure toward the printing mask from the pressurizing member to the solder paste by making the solder paste pass in a direction opposite to the printing direction of the squeegee through a first gap formed between the printing mask and the pressurizing member during solder paste printing in a state in which an elongated pressurizing member provided in a vicinity of an edge of the squeegee is positioned in a pressurizing position where a pressure is applied to the solder paste from a retreated position where no pressure is applied thereto; and making the solder paste pass again through the first gap located between the pressurizing member and the printing mask after the solder paste that is passing from the first gap toward the squeegee side passes

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through a second gap located between the squeegee and the pressurizing member (claim 11).

Watanabe teaches a stencil printing method, including a heating element (3) for directly heating printing ink, nonrotatable, and disposed axially to the squeegee in the vicinity of the edge of the squeegee, thereby forming a gap between the heating element and the screen, and a gap between the heating element and the squeegee (Fig. 1).

Regarding claims 1, 4, 8, 11, and 13, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Chikahisa to include a heating element for directly heating printing ink, nonrotatable, and disposed axially to the squeegee in the vicinity of the edge of the squeegee, thereby forming a gap between the heating element and the screen, and a gap between the heating element and the squeegee, because Watanabe teaches that such a heating element is advantageous for precisely controlling the viscosity of the material used for printing, thereby improving the print quality.

Allowable Subject Matter

7. Claims 9, 10, and 14-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 9, the prior art of record does not teach a solder paste printing apparatus as described in claim 1, having all of the structure as claimed, including wherein the cross-section shape of the pressurizing member is varied according to a number and a size of the

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openings of the print mask.

Regarding claim 10, while the prior art of record does teach pressurizing members which rotate in the direction of solder paste around the pressurizing member, the prior art of record does not teach a solder paste printing apparatus as described in claim 1, having all of the structure as claimed, including wherein the pressurizing member is rotated in a direction reverse to a rolling direction of the solder paste around the pressurizing member.

Regarding claim 14, the prior art of record does not teach a solder paste printing method as described in claim 11, having all of the structure and steps as claimed, including wherein the cross-section shape of the pressurizing member is varied according to a number and a size of the openings of the print mask.

Regarding claim 15, the prior art of record does not teach a solder paste printing method as described in claim 11, having all of the structure and steps as claimed, including wherein the pressurizing member is rotated in a direction reverse to a rolling direction of the solder paste around the pressurizing member.

Regarding claim 16, the prior art of record does not teach a solder paste printing apparatus as described in claim 1, having all of the structure as claimed, including wherein a pressure sensor is provided on the back surface of the printing mask and which detects a pressure of the solder paste.

Regarding claim 24, the prior art of record does not teach a solder paste printing method as described in claim 11; having all of the structure and steps as claimed, including wherein the pressure of the solder paste is detected, and said detected pressure is used to control the driving

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conditions of the squeegee.

9. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

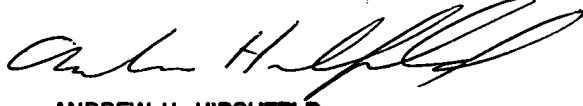
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Katsuyama et al., US 5,323,700, Hasegawa et al., US 5,095,816, and Hancy, US 5,027,703 each teach screen printing apparatus having obvious similarities to the instant application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leo T. Hinze whose telephone number is (703) 305-3339. The examiner can normally be reached on M-F 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on (703) 305-6619. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0952.

Leo T. Hinze


ANDREW H. HIRSHFELD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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Patent Examiner

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28 October, 2003